

Eugenia (45).

Mean Solar Time of Observation.	R. A. from Observation.	N.P.D. from Observation.
^h ^m ^s	^h ^m ^s	[°] ['] ["]
1861, April 5 11 39 36.0	12 36 35.39	86 0 32.30
25 10 7 56.5	12 23 31.91	84 18 37.54
27 9 59 8.6	12 22 35.74	84 12 32.81

All the observations of N.P.D. are corrected for refraction and parallax.

The observations of *Angelina* (64), printed in the *Monthly Notice* for April, were made, 1861, March 21 and 22, and not, as there stated, March 15 and 22.

No occultations of Stars by the Moon were observed.

Phenomena of Jupiter's Satellites.

Day of Ob- servation.	Satellite.	Phenomenon.	Mean Solar Time.	Observer.
1861.			^h ^m ^s	
April 5	IV.	Ingress, first cont.	11 7 58.4	J. C.
5	IV.	„ bisection	11 12 27.7	J. C.
5	IV.	„ last cont.	11 17 56.8	J. C.
5	IV.	„ first cont.	11 8 50.7	N.
5	IV.	„ bisection	11 12 35.1	N.
5	IV.	„ last cont.	11 16 34.4	N.
8	II.	Egress, last cont.	7 47 6.6	A. D.
16	III.	Ecl. reappearance	7 17 45.2	C.
23	III.	Ecl. reappearance (a)	11 16 39.0	E.

(a) The satellite was thought to have reappeared a few seconds before it was seen.

The initials E., C., J. C., A. D., and N., are those of Messrs. Ellis, Criswick, Carpenter, Davis, and Newcomb.

Mr. Carrington's Chronograph.

Mr. Carrington exhibited at the evening Meeting an instrument for the registration of time-signals on a fillet of paper, the parts of which were put in motion that their performance might be inspected in working order. He commenced his explanation by acknowledging the assistance he had received in carrying out his ideas from Mr. C. V. Walker, Telegraph Engineer to the South Eastern Railway Company, who permitted the works to be executed at Tunbridge by the skilled workmen at the clock-factory under his direction.

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In devising a modified form of Chronograph his object was twofold; 1st, to supply a want felt last summer at Redhill during a period of great solar activity, of the power of recording many more signals in a given time than could be done by the ear, eye, and pencil; 2d, to endeavour to reduce the cost of such an instrument so considerably as to place it within the reach of all observers; for in his intercourse with private astronomers he had frequently become aware of the difficulty found by them in making observations of position where it was required to count and register differences of time with a half-second chronometer.

The parts of the instrument, of which full-size plans will be deposited with the Society, were mainly three; 1st, the reel carrying the fillet; 2dly, the machine for driving and stamping; and 3dly, a sustained pendulum, by which at every vibration a current was allowed to pass from a battery of three cells, and the time-pen of (2) made to register a time scale dot. The reel can require no particular description, but it may be stated that the fillet wound on it was in size and quality similar to that used for the London District Telegraphs, and may readily be procured at an extremely low price in any length and quantity. The pendulum was of a length beating $\frac{6}{10}$ seconds, (in the instrument exhibited) and was accompanied by only so much of the usual clock-train as was necessary for keeping up its vibrations and enabling it to do the work required, of making slight metallic contacts. For this purpose it was crooked at about one-fourth of its length from the point of suspension, and a steel point introduced directed upwards, which at every vibration in passing the lowest point touched a point on the other side of a small doubly inclined plane, placed beneath a horizontal flexible spring. By the momentary contact so made, the duration and delicacy of which was regulable by a screw, two ends of a wire were placed in metallic contact, and a current allowed to pass to the machine (2).

This portion (2) consisted of a train of wheels for driving and regulating the rotation of a narrow drum, over which passed the fillet, which was drawn along at a rate liable to very small variation from under an inking desk, through the bottom of which worked three small platina plungers or wire pens, dropped by the passage of galvanic currents through corresponding pairs of electro-magnets. The regulation of the rate of the driving train was effected by two small centrifugal spring pieces, attached to the circumference of a fly forming the last wheel of the train, and the friction of which against two opposed surfaces admitting of adjustment established and maintained an evenness of rate amply sufficient for the object in view. The arrangement of the inking apparatus is due to Prof. Wheatstone, from whom was borrowed the ingenious idea of drilling holes through the bottom of a metallic disk too

small to admit of the escape of a drop, and through which the plungers or pens descend freely, with their tips constantly moistened by the capillary action of the small holes in which they remain while at rest.

The descent of the middle pen was regulated by the pendulum, and recorded on the fillet a series of centre dots at distances indicating on the scale intervals of time of six-tenths of a second. The other two, which may be termed the A and B pens, are under the control of the observer, who holds in his hand a contact maker, with which either one or the other pen is made to descend instantaneously and record a dot. In Mr. Carrington's method of observing the positions of solar spots, the interval of passage of the Sun's diameter would be represented on the fillet by a length of about $10\frac{1}{2}$ feet, divided into equal intervals, and on one side by the A pen would be recorded the contacts of limbs and spots with pen A, and on the other those of pen B, the unit of measurement employed being of no moment whatever; and it is evident that, wherever two co-ordinates can be observed instantaneously by this or analogous methods, the new Chronograph will be found an aid to the observer. Its especial use is, however, in cases where it is necessary to record with great rapidity, or in the absence of all light, as when a faint object is present in an equatoreal; other previously devised instruments being more suitable for meridional observation.

The machinery and weights of the instrument exhibited cost less than 12*l.*, a part of which was incurred by alterations necessary in a first trial, and with table, battery, and appurtenances, the whole did not exceed 13*l.* The essential parts of the common clock may be purchased in Clerkenwell at prices far less than would commonly be believed till known; and if a clever workman disposed to employ his evenings after usual hours can be met with, experiments similar to those from which resulted the above machine may be tried without very alarming or deterring expense.

Observations and Elements of Comet I., 1861.

(Extract of a Letter from Mr. Bond to Mr. Carrington.)

The comet discovered by Mr. A. E. Thatcher, of New York, on April 4th, has been observed here as follows:—

Comet I., 1861.			
	Camb. M.S.T.	R.A.	Decl.
1861.	h m s	h m s	° ' "
April 10	11 34 42	17 7 42.60	+ 59 28 12.8
11	9 27 6	17 2 26.69	60 9 0.2
14	9 1 27	16 40 14.35	62 30 7.1
18	14 21 33	15 49 15.55	65 52 42.9